

16/2/52

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Dear Hayes,

Thank you for your letter of Feb. 10th and the enclosed note to Nature ; I am interested to see that UV stimulation agrees with, and perhaps follows from, fertility behaviour. I have a strain with a higher frequency of recombination that seems to have a higher sensitivity to UV stimulation than 5-161 (from which it was derived). As to Spicer's infertile strain - I think he sent me a subculture of it some time ago; I can recall writing him something about infertility of one of his strains - it is probably the fourth occurrence of the same event, viz. mutation to infertility. The first must have been in the building of TLB₁ - ; one occurred in a B₁- strain which I treated with Ny in 1949; another to Mrs. Lederberg again in a B₁- strain. I have a subculture of this, which was sent to me by Lederberg.

Re your experiments: I think I can predict the result of the experiment which you plan, of infecting an infertile strain with a fertile one. It was discovered by Lederberg a month ago, and I was reaching when I heard of it, exactly the same conclusion, that fertility (rather: self-fertility) is infective. It is very highly infective. In 4 hours contact (shorter exposures not tested) 90% of the cells of an infertile strain are infected. It is not easy to detach the transforming principle off the fertile cells; I hope however to confirm some experiments which were positive recently. Infection is more difficult in the presence of DNA-ase ; and is enhanced by UV-stimulation, so that it may well be that the transforming principle be the same ^{substance} which makes your irradiated cultures viscid. However, the transforming principle must b

be either insoluble or highly unstable in solution, since it cannot be recovered easily in filtrates.

When I suggested crossing two streptomycin-sterilised strains together, I meant of course using two fertile strains. I have some idea that gametes -if there are any such things - may be formed on both sides. On the present evidence, it may be that the ~~infertility~~ inability of streptomycin sterilised infertile cells to cross with fertile strains is due to their incapacity of reacting to the fertility transforming principle by forming gametes. One fact has emerged however, which throws doubt on the whole recombination story: in the infection for fertility, infection between living cells occurs, but nothing is usually found in the filtrates. Does this not look like what happens for prototroph formation? I still believe there is a fundamental difference between the two phenomena, but I am not as sure about it as I was a month ago.

I shall be in London for a few days in the first week of March and shall ring you up; I shall take this opportunity for letting you have the strains which you demand. As to the meeting of European micro-bio-geneticists, I think you will hear soon of it officially ^(from me) it will be from 1-5 September, the place is not yet decided -except that it will be in Italy. Would you please keep this information private.

Yours sincerely

P. . I shall send a copy of this letter to Ledeberg.